

**The Subgenus *Pseudoferonina* Ball
(Coleoptera: Carabidae: *Pterostichus*): Description of
Three New Species with a Key to All Known Species**

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Abstract.—Adults of three new species of the subgenus *Pseudoferonina* Ball (genus *Pterostichus* Bonelli) are described: *P. vexatus* Bousquet from Oregon, *P. smetanai* Bousquet from Washington and *P. campbelli* Bousquet from Oregon. A key to, and drawings of the median lobe of the aedeagus of, all known species of the subgenus are provided. The subgeneric name *Melvilleus* Ball (type-species: *Pterostichus shulli* sensu Ball, nec *Platysma shulli* Hatch = *Pterostichus vexatus* Bousquet, by original designation and monotypy) is considered as a junior subjective synonym of *Pseudoferonina* (NEW SYNONYMY).

The subgenus *Pseudoferonina* was proposed by Ball (1965) for two species, *P. lanei* Van Dyke and *P. humidulus* Van Dyke, previously assigned to the subgenera *Feronina* Casey and *Cryobius* Chaudoir respectively. In the same paper, Ball erected the subgenus *Melvilleus* for one species, which he misidentified as *P. shulli* Hatch, externally similar to those of *Pseudoferonina* but differing by some character states of the median lobe of the aedeagus.

The purpose of this paper is to describe the adults of three new species of *Pseudoferonina* and to provide a key to, and drawings of the median lobe of the aedeagus of, all known species. Members of the subgenus occur in western North America, specifically in the states of Idaho, Oregon and Washington.

Abbreviations used for the locations of the material studied are: CAS, California Academy of Sciences, San Francisco; CM, Carnegie Museum, Pittsburgh; CNC, Canadian National Collection, Ottawa; OSU, Oregon State University, Corvallis; UI, University of Idaho, Moscow.

***Pterostichus vexatus* Bousquet, NEW SPECIES**

Pterostichus shulli: Ball, 1965:110 (nec Hatch, 1949).

Description.—*Coloration*: dorsal surface of body, antennae and legs rufobrunneous, palpi rufous. *Microsculpture*: frons with isodiametric meshes; pronotum and elytra with moderately transverse meshes. *Pronotum* (Fig. 2): sides oblique in posterior half; anterior angles moderately produced; posterior angles obtuse; outer laterobasal impressions clearly impressed; inner laterobasal impressions punctate. *Legs*: mesotibia of male slightly curved apically (as in Fig. 5). *Abdomen*: last exposed sternum of male without secondary sexual characters. *Aedeagus* (Fig. 7): left side of apical portion of median lobe (in left lateral aspect) straight; apical portion of median lobe (in ventral aspect) without lightly sclerotized diagonal band.

Length of body: 9.0 mm.

Type material.—Holotype (male). *Idaho*: “Harvard, Ida. VII.22.’34 Bryant, 8./ Pter. (Melvilleus) shulli Hatch det. George E. Ball.” The specimen, which is deposited in the California Academy of Sciences, San Francisco, is complete but has the abdomen, part of the metathorax and right leg glued on a plate pinned with the specimen.

Distribution.—The species is known only from the type locality in Idaho. However, I have seen 1 male and 1 female, in OSU, labelled “Amda, Id. 7-22-1934 LT Turney” that probably belong to this species. Unfortunately, the aedeagus of the male is missing.

Remarks.—Adults of *P. vexatus* are very similar to those of *P. shulli* and *P. lanei* but differ mainly by the shape of the median lobe of the aedeagus (Fig. 7a) and the absence of a lightly sclerotized band on the ventral side of the median lobe (Fig. 7c).

Ball (1965) erected the monotypic subgenus *Melvilleus* for this species, which he misidentified as *P. shulli*, pointing out that it “is most similar to the species of *Pseudoferonina*, but the males are readily separated on the basis of the genitalic characteristics” However, I am unable to find any character states, even in the male genitalia, which would justify a subgeneric separation for that species. The morphological differences in the median lobe between *P. vexatus* and the other species of *Pseudoferonina* are comparable to those found between species of subgenera like *Leptoferonina* Casey and *Hypherpes* Chaudoir. Furthermore, members of *P. vexatus* are synapomorphic with those of *P. shulli* and *P. lanei* in having the mesotibia of the male slightly curved apically (Fig. 5).

Based on the above facts, I consider the name *Melvilleus* Ball (type-species: *Pterostichus shulli* sensu Ball, 1965, nec *Platysma shulli* Hatch, 1949 = *Pterostichus vexatus* Bousquet, by original designation and monotypy) as a junior subjective synonym of *Pseudoferonina* Ball (NEW SYNONYMY).

The drawing of the median lobe listed as that of *P. shulli* in Hatch (1953, Plate III, Fig. 15a–c) is that of *P. vexatus*.

Etymology.—The specific name is the Latin adjective *vexatus*, -a, -um (maltreated); it refers to the fact that the species has been misidentified in the past.

***Pterostichus smetanai* Bousquet, NEW SPECIES**

Description.—*Coloration*: dorsal surface of body piceous to black, elytra slightly iridescent, basal antennomeres, palpi, epipleura and legs rufobrunneous to piceous. *Microsculpture*: frons with isodiametric meshes; pronotum with moderately transverse meshes, feebly impressed on disc; elytra with very transverse meshes. *Pronotum* (Fig. 3): sides sinuate in posterior half; anterior angles strongly produced; posterior angles slightly acute to right; outer laterobasal impressions impressed; inner laterobasal impressions slightly punctate. *Legs*: mesotibia of male straight (Fig. 6). *Abdomen*: last exposed sternum of male with shallow depression medially. *Aedeagus* (Fig. 11): left side of apical portion of median lobe (in left lateral aspect) strongly sinuate near middle and slightly sinuate subapically; apical portion of median lobe (in ventral aspect) with lightly sclerotized diagonal band.

Length of body: 8.2–8.5 mm.

Material.—Holotype (male). *Washington*: “Wash. Mt. St. Helens Spirit Lk., Bear Crk. 3200', 6.VII.74 A & D Smetana.” The specimen, which is housed in

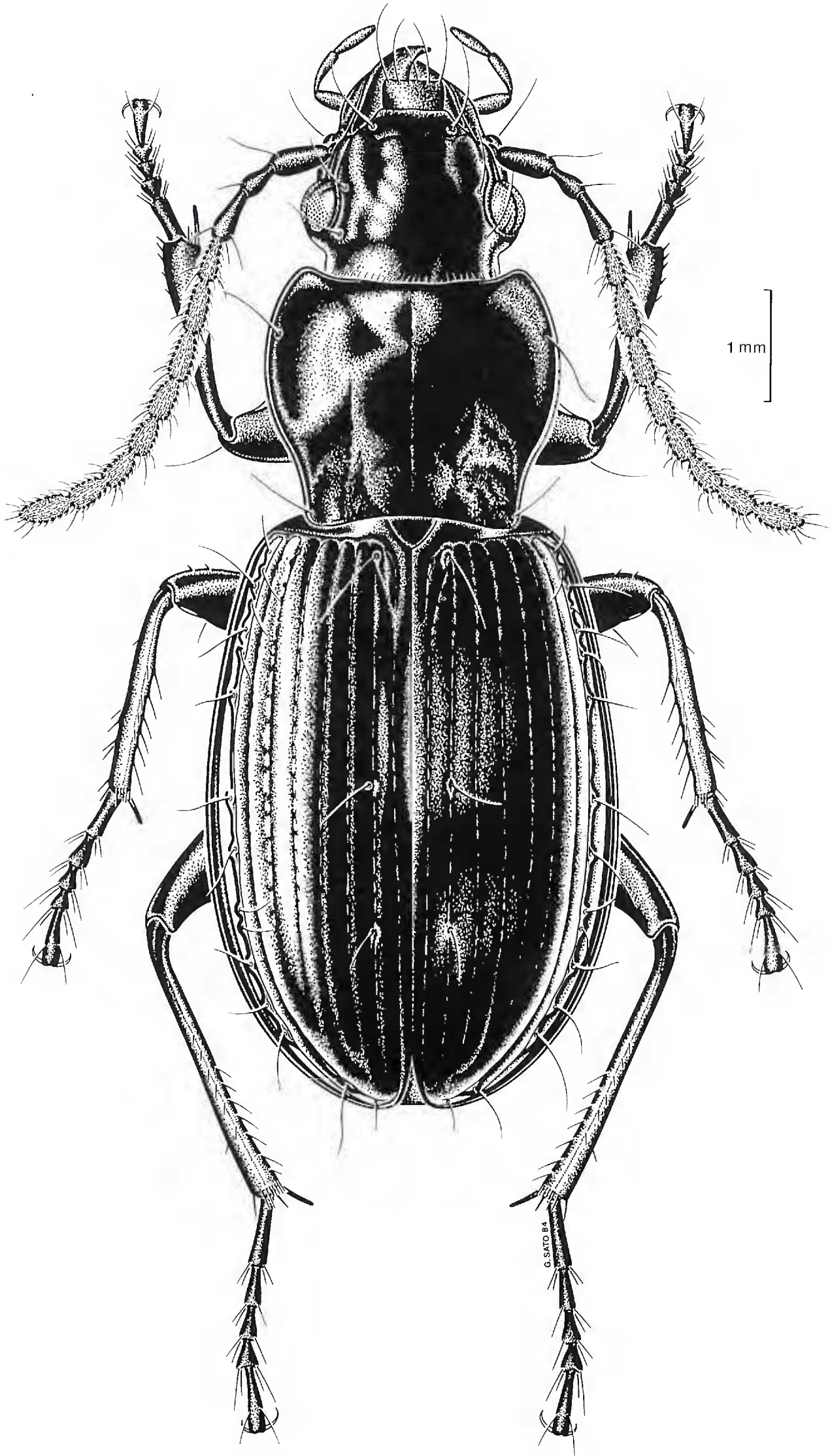
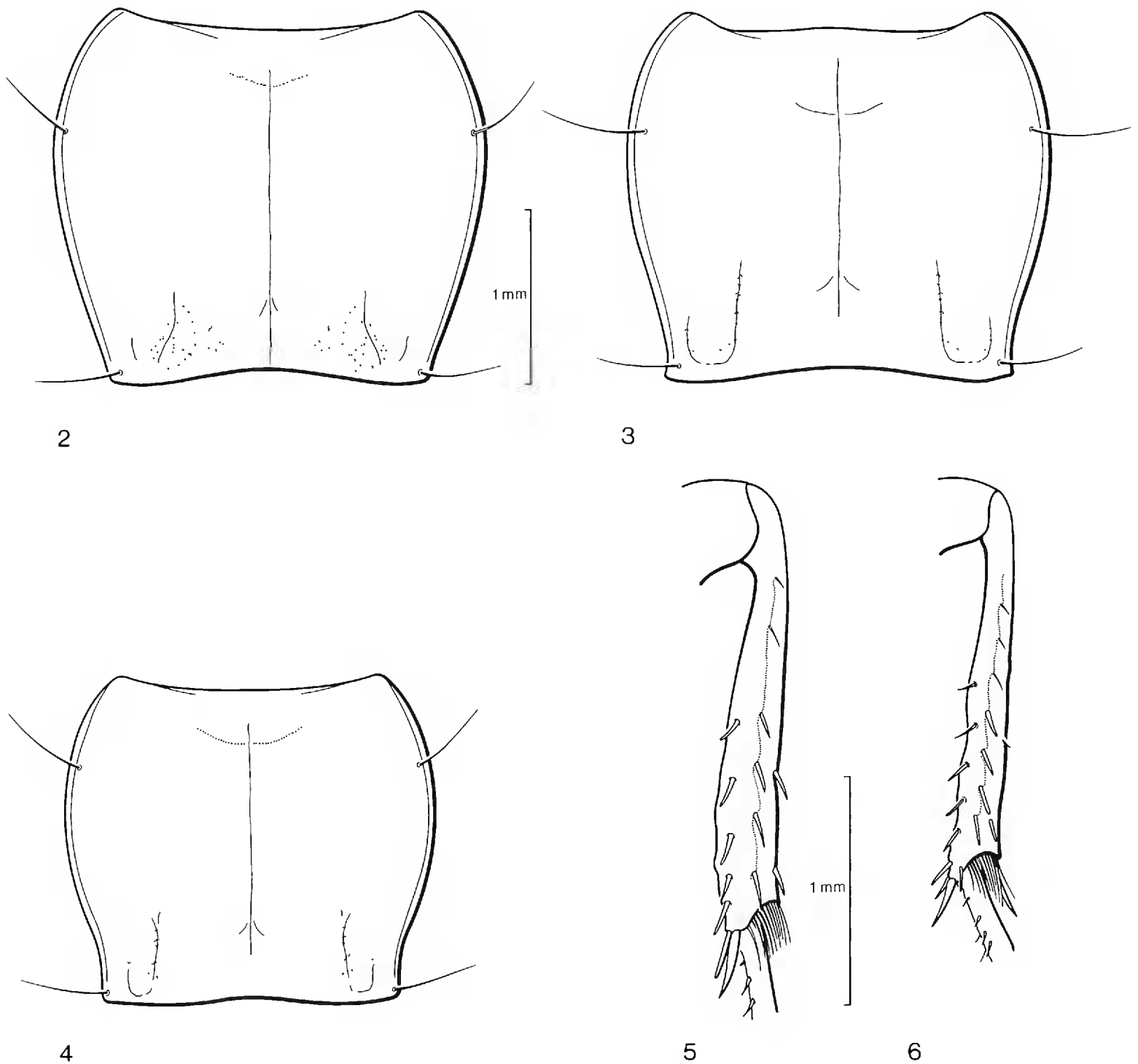


Figure 1. *Pterostichus smetanai* Bousquet, new species.



Figures 2-6. 2-4. Pronotum. 2, *P. vexatus*; 3, *P. smetanai*; 4, *P. campbelli*. 5, 6. Mesotibia of male (dorsal aspect). 5, *P. lanei*; 6, *P. smetanai*.

the Canadian National Collection (CNC No. 18400), has the last five (right) and seven (left) antennomeres and the tibia and tarsus of the left posterior leg missing.

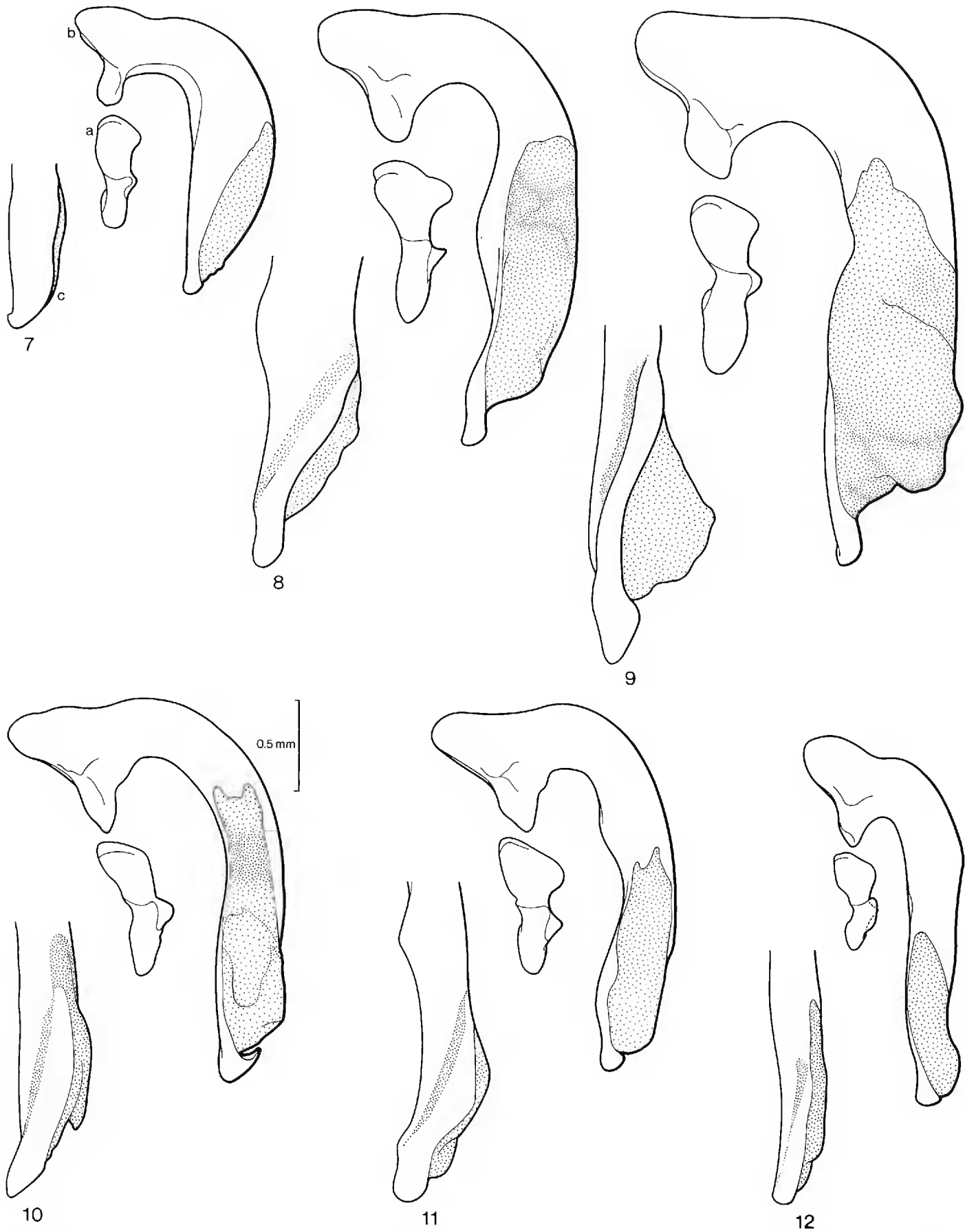
Paratypes. *Washington*: same data as holotype (CNC), 2 females.

Distribution.—*Pterostichus smetanai* is known only from the type locality in Washington.

Habitat.—The three known specimens were collected at a wild creek on a steep forested slope on shaded, wet places constantly sprinkled with water, under rocks and pieces of bark on ground, together with adults of *Pterostichus johnsoni* Ulke and *Nebria* sp. (A. Smetana, pers. comm.).

Remarks.—Adults of this species are very similar to those of *P. campbelli* but differ by the shape of the median lobe of the aedeagus.

Etymology.—Patronymic, the species was named in honour of A. Smetana, Biosystematics Research Institute, Ottawa, who collected the specimens of the original series.



Figures 7–12. Right paramere (*a*), median lobe (left lateral aspect) (*b*) and apical part of median lobe (ventral aspect) (*c*) of aedeagus. 7, *P. vexatus* (holotype); 8, *P. shulli* (holotype); 9, *P. lanei* (holotype); 10, *P. humidulus* (holotype); 11, *P. smetanai* (holotype); 12, *P. campbelli* (holotype).

***Pterostichus campbelli* Bousquet, NEW SPECIES**

Description.—Similar to *P. smetanai* except for the following character states. *Pronotum* (Fig. 4): anterior angles less produced. *Aedeagus* (Fig. 12): left side of apical portion of median lobe (in left lateral aspect) slightly sinuate subapically.

Type material.—Holotype (male). *Oregon*: “Ore. Tillamook Co 1 mi S Hebo

28.VII.1979 JM & BA Campbell." The specimen is housed in the Canadian National Collection (CNC No. 18401).

Paratypes. *Oregon*: "Cannon Beach, Oregon VII-18-37" (CAS), 1 male, 1 female.

Distribution.—*Pterostichus campbelli* is known from Oregon but may also occur in Washington (see below).

In addition to the type material, I have seen 40 specimens, tentatively assigned to this species (see remarks), from the following localities: *Washington*: "Was." (CM), 1 ♂, 1 ♀. *Oregon*: Pacific City, 21.VII.42, K. M. Fender (OSU), 1 ♂; Alsea, 7.V.39, H. P. Lanchester (OSU), 1 ♂; Lobster Valley, 15 mi SW Alsea, 27.V.72, P. Lattin (OSU), 1 ♂; Bald Mt., Polk Co., 23.VIII.42 (OSU), 1 ♂; Mike Bauer Wayside, Lincoln Co., 30.VIII.81, 6.IX.81, J. R. LaBonte (CAS), 1 ♂, 2 ♀; Mike Bauer Park, Lincoln Co., 25.IX.81, P. J. Johnson (UI), 2 ♀; Grass Crk., Lincoln Co., 25.IX.81, P. J. Johnson (UI), 3 ♂, 7 ♀; nr. Canal Crk., Lincoln Co., 25.IX.81, P. J. Johnson (UI), 7 ♂, 7 ♀; Peavine Ridge, nr. McMinnville, 18.X.46, K. M. Fender (OSU), 1 ♀; Gunaldo Falls, Yamhill Co., 30.VI.49 (OSU), 1 ♀; Boyer, 23.VII.41, K. M. Fender (OSU), 1 ♀; Latourell Falls, Multnomah Co., 8.V.37, M. H. Hatch (OSU), 1 ♀; Cannon Beach, 14.VII.37 (OSU), 1 ♀.

Habitat.—The holotype was collected by sifting deciduous leaf litter along a small stream (J. M. Campbell, pers. comm.). Some of the specimens studied have the following habitat labels: "sea drift after storm," "marshy area above river."

Remarks.—Adults of *P. campbelli* are very similar to those of *P. smetanai* and can be positively separated only by the examination of the median lobe of aedeagus.

Males assigned to *P. campbelli* show variation in the shape of the median lobe. Some specimens have the apical portion of the median lobe less sinuate apically and the apex more obliquely rounded (in left lateral aspect) than the holotype, while others have the apical portion of the median lobe more twisted than the holotype. I have not seen enough specimens of the subgenus to decide whether or not these morphological differences fall within the range of variation of *P. campbelli*. I have limited the type material to the specimens mentioned because of the possibility that the additional material studied may include more than one species.

The drawing of the median lobe listed as that of *P. humidulus* in Ball (1965, Fig. 4) is that of *P. campbelli*.

Etymology.—Patronymic, the species was named in honour of J. M. Campbell, Biosystematics Research Institute, Ottawa, who collected the holotype.

DISCUSSION

In addition to the three species described here, the subgenus *Pseudoferonina* includes three more species: *P. shulli*, *P. lanei* and *P. humidulus*. These species can provisionally be placed into 2 groups. Members of the first, which includes *P. vexatus*, *P. shulli* and *P. lanei*, are characterised by having the sides of the pronotum oblique (Fig. 2) or slightly sinuate in the posterior half, and the mesotibia of male slightly curved apically (Fig. 5). The species occur east of the Cascade Range, in Washington and Idaho. Members of the second group, which includes *P. humidulus*, *P. smetanai* and *P. campbelli*, differ by having the sides of the pronotum clearly sinuate in the posterior half (Figs. 3, 4), and the mesotibia

of male straight apically (Fig. 6). The species occur in the Pacific coast area and the Cascade Range, in Washington and Oregon. While the first group of species is probably monophyletic, as its species share the synapomorphy related to the form of the mesotibia of the male, I was unable to find any evidence suggesting that this is also the case for the second group of species.

Members of species of each group are very similar to each other externally and can be distinguished with confidence only by examination of the median lobe of the aedeagus. Adults of these species differ from those of other groups of Pterostichini (sensu stricto), occurring in Western North America, by the following combination of character states: microsculpture of elytra transverse; third interval of elytra with 2 discal setae; metacoxa with 2 setae (both laterad); seta on meta-trochanter present; metepisterna subquadrate (medial and anterior margins subequal in length).

The following key should enable students to separate adults of the species of *Pseudoferonina*.

KEY TO ADULTS OF THE SPECIES OF *PSEUDOFERONINA* BALL

1. Mesotibia of male slightly curved apically (Fig. 5). Sides of pronotum oblique (Fig. 2) or slightly sinuate in posterior half 2
 Mesotibia of male straight apically (Fig. 6). Sides of pronotum clearly sinuate in posterior half (Figs. 3, 4) 4
2. Median lobe of aedeagus in ventral aspect without lightly sclerotized diagonal band (Fig. 7c) *P. vexatus* Bousquet
 Median lobe of aedeagus in ventral aspect with lightly sclerotized diagonal band (Figs. 8c-9c) 3
3. Median lobe of aedeagus in left lateral aspect strongly sinuate behind middle (Fig. 8b). Outer laterobasal impressions of pronotum impressed ..
 *P. shulli* Hatch, 1949
 Known only from Idaho. Specimens studied: holotype (male) and allotype (female) with label "Pierce Idaho May 23, 1929 Alt 3200 W. E. Shull Collector" in OSU.
 Median lobe of aedeagus in left lateral aspect not sinuate behind middle (Fig. 9b). Outer laterobasal impressions of pronotum absent or faintly impressed *P. lanei* Van Dyke, 1925
 Known from Washington and Idaho. Specimens studied: holotype (male) with label "Wawawai, Wash. May 31, 1921 M. C. Lane Col." in CAS; 4 specimens with label "Idaho, Boise Co. 10 mi NE Idaho City, 10-Mile cmpdg., 18.VII.1981, J. M. Campbell" in CNC.
4. Last exposed sternum of male with 2 median protuberances. Apex of median lobe of aedeagus with a right projection (in left lateral aspect) (Fig. 10b) *P. humidulus* Van Dyke, 1943¹
 Known only from Washington. Specimens studied: holotype (male) with label "Hoquiam Wash. V-27-1914 E. C. Van Dyke Collector" in CAS; one male (teneral) with label "Nasel R. Wash Pacific County Sept.9.1929" in OSU.
 Last exposed sternum of male without protuberances. Apex of median lobe of aedeagus without projection (in left lateral aspect) (Figs. 11b-12b) .. 5

¹ First described as *Pterostichus pacificus* Van Dyke, 1926, nec *P. pacificus* Poppius, 1906.

5. Median lobe of aedeagus in left lateral aspect sinuate near middle (Fig. 11*b*) *P. smetanai* Bousquet
 Median lobe of aedeagus in left lateral aspect not sinuate near middle (Fig. 12*b*) *P. campbelli* Bousquet

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